

BLACKLEG

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AND

ALLIED DISEASES

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PREPARED BY
VETERINARY SERVICES BRANCH

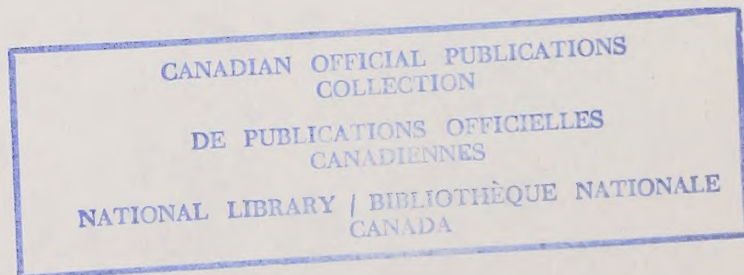
HON. L. C. HALMRAST, MINISTER

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INTRODUCTION

Blackleg and the similar infections discussed in this bulletin cause a heavy loss of livestock in Alberta every year. These diseases are caused by similar bacteria called Clostridia and generally cause a rapidly fatal infection when they enter the animal's body. The bacteria are capable of living for long periods in the soil because of their ability to form spores, which protect them from the action of the weather. The main purpose of this bulletin is to familiarize livestock owners with the common infections blackleg and malignant oedema. Besides these two common diseases, the following are discussed in this bulletin:

- (1) Black Disease
- (2) Red Water Disease
- (3) Enterotoxemia (Pulpy Kidney Disease)
- (4) Tetanus (Lock Jaw).



BLACKLEG

Blackleg is a disease of cattle, and less frequently sheep, caused by a soil-borne bacterium, *Clostridium chauvei*. The disease develops very rapidly in affected animals and often losses occur before the owner has noticed any sickness in the herd.

DISTRIBUTION -



Blackleg occurs on all continents, although there are some local areas in various countries which are not affected. In Alberta most parts of the province are affected, and new outbreaks are found almost yearly in areas where the disease had not previously been reported. For this reason livestock owners should not feel that

they will not have blackleg losses simply because they never have before. Since the causative bacteria are soil-borne, the disease may be introduced to new areas, in several ways, i.e. wind storms, water-ways, wild animals etc.

SYMPTOMS -

Blackleg is most commonly seen in the warmer months of the year, and in young animals on pasture. Calves and yearlings are most often affected. Very often no symptoms are observed; the animals are found dead in the pasture with no previous signs of illness. At other times one or more of the young calves show signs of illness by a high fever, lack of appetite, depression, lameness, and swellings that appear in the muscles on various parts of the body. Sometimes the leg muscles are involved or the muscles in the region of the back, hip, flank, chest or shoulder. In the latter stage of the disease these swellings become quite mushy and spreading and produce a characteristic crackling sound when pressed with the hand. This sound is due to the gas under the skin which is produced by the growing bacteria.

POST-MORTEM CHANGES -

Putrefaction occurs rapidly in the carcass of an animal infected with blackleg and results in a typical bloated appearance of the carcass soon after death. The legs are extended stiffly, and a frothy bloody discharge is often apparent at the anus and the nostrils. The skin over the swelling is usually normal, but in the centre it may have undergone dry gangrene. When cut open and examined, the swellings are usually found to contain discolored serum and gas. When affected muscles are cut open they are usually found swollen and either black or darker in color than normal, with gas present. It is unwise to cut open a swelling unless necessary for a diagnosis as this will increase the contamination of the soil.

DIAGNOSIS -

Livestock owners should familiarize themselves with the symptoms of this dangerous and costly disease, so that cases are not passed off as bloat or ignored. A veterinarian should be called to make an accurate diagnosis as soon as possible. A wrong diagnosis or no diagnosis could be serious and expensive because more animals may become infected with resultant heavy losses in the herd. It is often difficult to make an exact diagnosis in the field because of the similarity of the symptoms of blackleg to certain other diseases. Lead, mercury, arsenic poisoning, bloat, as well as some of the plant poisons have been confused with blackleg. Although certain features of the disease may aid in making a tentative diagnosis, it is often possible to make an accurate diagnosis only in the laboratory.



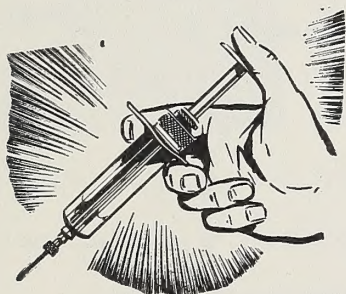
In areas where veterinary services are not available, specimens may be forwarded to the Provincial Veterinary Laboratory, Department of Agriculture, Edmonton. A portion of the affected muscle tissue can be placed in a sterilized glass jar, sealed, and packed so the jar won't break. Forward this, packed in ice

in warm weather, to the laboratory as soon as possible after the death of the animal. In cases where a complete post-mortem is performed, a portion of the liver and other abnormal tissues from the suspected case should also be forwarded.

TREATMENT -

If cases are noted in the early stages of infection, they may respond to immediate treatment with penicillin or other antibiotics in large doses. It is essential, of course, that an accurate diagnosis be made in order that the correct treatment is given. In recovered cases the animal may be stiff in the leg, shoulder, etc., due to shrinking or thickening of the muscles.

CONTROL AND PREVENTION -

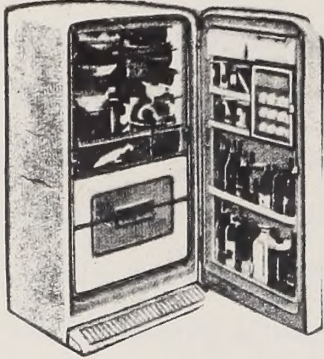


Since it is practically impossible to prevent animals from coming into contact with the disease, the chief control method for blackleg is building up resistance in the animals by use of a bacterin, or vaccine.

The recommended procedure for vaccination is to inoculate all young cattle three months of age with a bacterin, or vaccine. Because blackleg and malignant oedema are so similar and often may be present in an outbreak, it is recommended that the so-called mixed bacterin be used. This contains the killed bacteria of both diseases, (*Clostridium chauvei* - *Clostridium septicum*). If the calves are on pasture a second injection of the bacterin should be given at six months of age. To be on the safe side, and to ensure as permanent immunity as possible, all the cattle should be revaccinated annually until they reach 3 years of age. Routine vaccination procedures will vary with the type of livestock operation involved.

In case of an outbreak of blackleg in a herd it is advisable to vaccinate or revaccinate, as the case may be, all of the animals with a recommended dose of the bacterin. The young cattle under three months should be given a half dose followed by a full dose when three months of age. As with other vaccines, there is a period of about two weeks following vaccination in

which the animals have not built up a strong resistance to the disease. Losses may continue during this period, so it is often advisable to move the herd to another pasture after losses from blackleg occur and vaccination is carried out.



The bacterins in use for vaccination against blackleg and malignant oedema are perishable products and deteriorate rapidly if not stored properly. The manufacturer's directions regarding storage and handling should be rigidly followed in order to assure the highest potency of the vaccine. After the vaccination

has been completed, if some vaccine is left in the container, it should be discarded and not retained for later use.

SANITATION -

The bacteria which cause blackleg are capable of living in the soil. They have the capacity to form spores which can protect the organism from the effects of weather, and hence soil can remain infected for long periods of time. Carcasses of animals affected by the diseases are the chief source of soil infection. They harbor the germs in large numbers and liberate them from both artificial and natural body openings into the surrounding soil. For this reason every dead animal should be promptly burned or buried. The surface of the ground may be treated by burning it over with a heavy layer of straw, used oil, etc.



MALIGNANT OEDEMA



This disease, commonly called Stable Blackleg, is similar in nearly all respects to blackleg; in fact, the similarity is so close that often a diagnosis can be made only when the specific bacteria present are identified in the laboratory. Furthermore, both organisms may be present in the same outbreak, or even the same animal.

Malignant oedema does differ from blackleg in some respects. It is caused by a bacterium called *Clostridium septicum*. It is more common in older animals, and also is more likely to occur during the winter months than blackleg.

The information given in this bulletin on blackleg also applies to malignant oedema, and for practical purposes, symptoms, treatment and control are the same.

BLACKLEG AND MALIGNANT OEDEMA OF SHEEP



These two diseases are indistinguishable in sheep, except by laboratory examination; however, the conditions are not commonly seen in Alberta. The infection occurs in sheep after contamination of wounds by soil-borne spores. By this method of infection, blackleg or malignant oedema may cause losses from navel infection in new-born lambs, in rams after fighting, and from contamination of wounds inflicted during shearing, dipping, lambing, castrating, or docking. The diseases may occur in sheep of any age.

Control, treatment and prevention of these diseases are the same as for control of these infections in cattle. Particular attention should be given to cleansing and disinfection of instruments, hands, etc., when operating on sheep. In areas where this disease is known to exist, lambs should be vaccinated at one month of age with one-half the dose recommended for cattle. A booster injection should be administered at three months of age.

ENTEROTOXEMIA

A disease becoming increasingly prevalent in Alberta is the condition known as Enterotoxemia, or Pulpy Kidney disease. This is a disease most commonly affecting sheep, caused by the bacteria *Clostridium perfringens*. Lambs in the best nutritional condition are affected at two approximate ages: first when they are two to twelve weeks of age, or later at four to six months, when at feeder age. The death loss may run as high as 100% of the affected flock.

Sudden deaths in a flock of animals at these two age levels should be viewed with suspicion, and diagnosis entrusted to a qualified veterinarian.

Veterinarians have an antitoxin and a bacterin available which are both quite effective in the prevention of this disease. An early diagnosis and preventative vaccination program can help considerably in reducing the losses in the flock. In feeder lambs, reduction in the amount of the grain ration for a few days, also helps to reduce losses. Experience in several flocks in Alberta has shown that routine vaccination of lambs with *Clostridium perfringens* Type D Bacterin results in thriftier and more efficient lambs. However, the main preventative of this disease in feeder lambs is to avoid access to a heavy grain ration when first placed in the feed lot. A small amount of grain should be fed at first, and gradually increase the grain ration as the lambs become accustomed to it.

Clostridium perfringens Type D, on occasions, may infect cattle and cause heavy losses in the herd. The infection in this species can occur in both the young and the old animals in the herd, but usually affects those on heavy grain feeding. An early diagnosis of this disease is important, because a very efficient bacterin is available which, if used early in an outbreak, can prevent heavy losses. A reduction in grain is also helpful in reducing losses in cattle.

BLACK DISEASE

This is a disease of sheep found mainly in the areas of the province which are infected with the parasite known as the liver fluke, which is fortunately quite rare in Alberta. The infection is caused by the bacteria *Clostridium novyi*, which becomes active in the liver tissue damaged by the liver fluke, and then produces the disease.

Feeder lambs from the drier pasture areas may suffer severe death losses within 3 weeks to a month after being placed on fluke infected pastures, or having access to irrigation ditches and swampy spots. Death occurs suddenly.

Post-mortem lesions of this condition can be easily confused with a number of other diseases, and a veterinarian should be called for an accurate diagnosis. Control of this disease relies on the preparation of vaccines, and the reduction or elimination of the liver fluke from infected areas.



RED WATER DISEASE

This is a condition of cattle caused by the bacteria *Clostridium hemolyticum*. The disease was so named because of the red color of the urine, which is one of the striking symptoms seen in infected animals. Animals affected with this condition become rapidly sick, with a high fever, depression, and die in 24 to 36 hours.

Here again, a veterinarian should be consulted for an accurate diagnosis of the disease present. The term "red water" is confusing, as there are several other cattle diseases in which reddening of the urine may occur.

Veterinarians have an anti-serum available, which is fairly effective in the treatment of these cases in the early stages of the disease. Vaccines are also available to be used as a preventative measure in areas where the infection is known to exist.



TETANUS

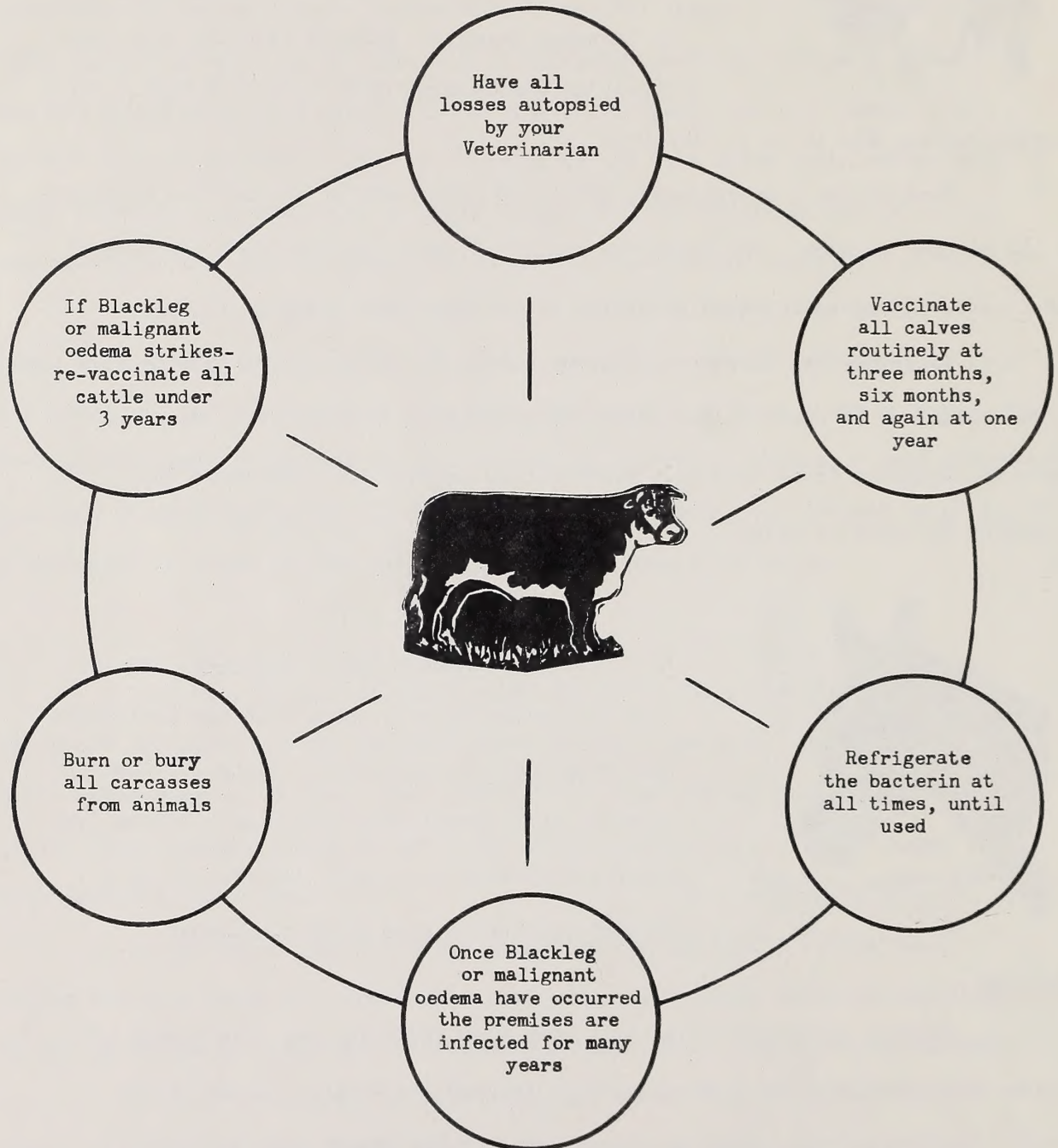
This disease, commonly called Lock-Jaw, results from the infection of a wound with the soil-borne bacterium *Clostridium tetani*. Among the domestic animals, the horse is the most common victim, and while the disease is rare in Alberta, it is a serious problem in some parts of Canada.

SYMPTOMS -

Tetanus is characterized by a very high fever and the development of rigid, tense muscles. The horse is unable to open its mouth. In the latter stages, the animal goes down and the muscles over the entire body become hard and contracted.

Treatment of infected animals is directed toward early cleansing and disinfection of wounds, and the use of antitoxins.

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